

REMARKS

Claims 1, 5 and 6 are amended herein to correct typographical errors. Claims 1 and 6 are also amended to further define the binder polymer.

Claim 8 is amended and rewritten as a process claim.

Claim 14 is amended to depend from claim 13.

Claims 15-20 are canceled herein.

Claims 21-22 are added herein.

Support for the amendment is found for example, on page 14, lines 1-4, and page 31 and the original claims of the present specification.

No new matter is presented.

Accordingly, upon entry of the Amendment, claims 1-14 and 21-22 will be all of the claims pending in the application.

I. Information Disclosure Statement

Applicants thank the Examiner for returning an initialed copy of the PTO/SB/08 Form filed with the Information Disclosure Statement on April 2, 2004. However, Applicants note that the Examiner has failed to return an initialed copy of the PTO/SB/08 Form filed with the Information Disclosure Statement on February 2, 2004. Thus, Applicants respectfully request the Examiner to return an initialed copy of the PTO/SB/08 Form submitted on February 2, 2004 with the next action.

II. Response to Claim Rejection under 35 U.S.C. § 112, 2nd Paragraphs

Claims 8, 14 and 16 are rejected under 35 U.S.C. § 112, 2nd paragraph, as being indefinite.

Claims 8 and 14 are amended herein to obviate the rejection. Claim 16 is canceled herein, thereby rendering the rejection as to this claim moot.

Accordingly, Applicants respectfully request withdrawal of the rejection under 35 U.S.C. § 112, 2nd paragraph.

III. Response to Claim Rejection under 35 U.S.C. § 102 over Oshima EP 1,176,467

Claims 1-20 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Oshima (EP, 1,176,467).

Applicants respectfully traverse the rejection and submit that Oshima does not disclose all elements of the presently claimed invention. Specifically, Oshima does not disclose the combination of the repeating unit represented by formula (I) and the repeating unit having a radical-polymerizable group represented by formula (A) or (C) as recited in independent claims 1 and 6. In contrast, binder polymer P-21 disclosed by Oshima and mentioned in the Office Action, contains repeating units PC-5, POC-1, and POC-7. However, none of the repeating units has a radical polymerizable group represented by formula (A) or (C). The advantages of the specific combination are explained as follows.

Vinyl groups such as acrylic groups and methacrylic groups have quite a high radical-polymerization efficiency. In contrast, allyl groups have a much lower radical-polymerization efficiency than those groups. This point is explained in "Radical Juugou Handbook" (Radical Polymerization Handbook) published by Kabushiki Gaisha NTS, (1999), pp. 319-323, enclosed herewith. Applicants provide the following translation of p. 319, right column, lines 6 to 21:

2. Characteristics of allyl polymerization

In the 1940s to 1950s, a lot of research on radical polymerization of allyl monomers was reported. However, not much basic research has been reported since the 1960s. This is because: polymerization of allyl monomers provides only oligomers, and fails to achieve the original target which is to obtain a new method for polymer synthesis. In order to obtain oligomers from allyl monomers at a high efficiency, the amount of required initiators is dozens of times the amount required in the case of usual vinyl monomers such as styrene and methyl methacrylate. This characteristic distinguishes polymerization of allyl monomers from usual vinyl polymerization, whereby polymerization of allyl monomers is called "allyl polymerization" even though allyl polymerization and usual vinyl polymerization are similar in that both are based on cleavage of carbon-carbon double bond."

As described in this book, the poor radical polymerizability of allyl monomers is the result of the stabilization of allyl radicals owing to conjugation of electrons in the allyl radicals.

For reference, pages II/69 to II/71 of "POLYMER HANDBOOK", third edition, published by John Wiley & Sons, Inc. (1989) are also enclosed herewith. In the Tables shown on II/69 to II/71, k_p represents a growth reaction rate constant of radical polymerization reaction and k_t represents a termination reaction rate constant of the radical polymerization reaction. Since radical polymerizability is determined by the balance (ratio) of the growth reaction and the termination reaction, k_p/k_t may be considered as an index for radical polymerizability. If k_p/k_t is higher, radical polymerizability is higher.

k_p/k_t values in the case of n-butyl acrylate are shown on p. II/69 and k_p/k_t values in the case of n-butyl methacrylate are shown on pp. II/70-II/71. From the tables and the description of the above book, it is suggested that acrylic groups have higher radical polymerizability than methacrylic groups, and both acrylic groups and methacrylic groups have much higher radical polymerizability than allyl groups.

When the binder polymer has functional groups with high radical polymerizability such as radical-polymerizable groups represented by formula (A) and (C), the crosslinking density in exposed areas is improved by the high radical polymerizability. Accordingly, the strength of the crosslinked film is improved and the printing durability is improved. It should be noted that radical-polymerizable groups represented by formulas (A) and (C) have vinyl groups, thus having higher polymerizability than allyl groups.

However, in unexposed areas (which should be removed by development), the high radical polymerizability causes thermal crosslinking to occur even in the dark. Even if the crosslinking degree is slight, the binder polymer cannot be easily removed by a developer, thereby causing development defects (the binder polymer remains in the unexposed areas). When the binder polymer remains in the unexposed areas (to which ink should not adhere), ink adheres to the unexposed areas, thus causing stains.

In the present invention, such problems are solved by simultaneous use of the repeating unit represented by formula (I). The effects obtained by simultaneous use of the repeating unit represented by formula (I) and the repeating unit represented by formula (A) or (C) cannot be expected by a person in the art.

As described above, use of a repeating unit represented by formula (A) or (C) is not taught in Oshima. Further, there is no motivation to use such a repeating unit in the polymer of Oshima since use of such a repeating unit with high polymerizability was usually believed to cause stains in non-image areas as described above. POC-1 disclosed in paragraph [0138] of Oshima has an allyl group which has much lower polymerizability than a repeating unit represented by formula (A) or (C). Accordingly, Oshima teaches away from replacing POC-1

with a repeating unit represented by formula (A) or (C) since the heightened polymerizability was usually expected to cause stains in non-image areas.

Accordingly, Oshima does not disclose, teach or suggest all elements of the present claims and therefore does not anticipate, nor render obvious, the claimed invention as recited in claims 1 and 6 as amended. Claims 2-5 and new claim 21 depend from claim 1 and claims 7-14 and new claim 22 depend from claim 6; therefore dependent claims 2-5, 7-14 and 21-22 are distinguished for at least the same reasons as claims 1 and 6, respectively. Claims 15-20 are canceled herein, thereby rendering the rejection of these claims moot.

In view of the above, Applicants respectfully request withdrawal of the rejection under 35 U.S.C. § 102 over Oshima.

IV. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. APPLN. NO. 10/673,332

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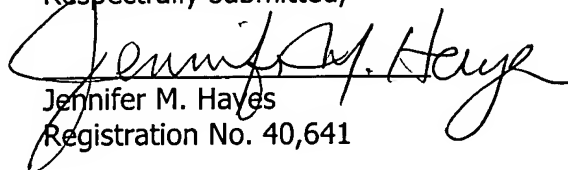
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